

## ABSTRACT

A system for controlling drilling mud density at a location either at the seabed (or just above the seabed) or alternatively below the seabed of wells in offshore and land-based drilling applications is disclosed. The present invention combines a base fluid of lesser/greater density than the drilling fluid required at the drill bit to drill the well to produce a combination return mud in the riser. By combining the appropriate quantities of drilling mud with a light fluid, a riser mud density at or near the density of seawater may be achieved to facilitate transporting the return mud to the surface. Alternatively, by injecting the appropriate quantities of heavy fluid into a light return mud, the column of return mud may be sufficiently weighted to protect the wellhead. At the surface, the combination return mud is passed through a treatment system to cleanse the mud of drill cuttings and to separate the drilling fluid from the base fluid. The present invention further includes a control unit for manipulating drilling fluid systems and displaying drilling and drilling fluid data.

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